DOCUMENT RESUME

ED 423 288 TM 029 095

AUTHOR Bergstrom, Betty A.; Lunz, Mary E.
TITLE Measuring Job Satisfaction: Reliability of Subscale Analysis.
PUB DATE 1998-04-00
NOTE 8p.; Roundtable paper presented at the Annual Meeting of the American Educational Research Association (San Diego, CA, April 13-17, 1998).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Adults; *Difficulty Level; Error of Measurement; Item Response Theory; *Job Satisfaction; *Measurement Techniques; Rating Scales; *Reliability
IDENTIFIERS *Rasch Model; *Subtests

ABSTRACT

The Job Satisfaction Survey (JSS) (P. Spector, 1985 and 1992) is a 36-item survey instrument designed to measure 9 aspects of job satisfaction, including: (1) pay; (2) promotion; (3) supervision; (4) benefits; (5) contingent rewards; (6) operating procedures; (7) co-workers; (8) nature of work; and (9) communication. In addition to measuring the nine subscales, the instrument was designed to yield a measure of overall satisfaction. This paper looks at whether the survey measures job satisfaction overall, and whether differences in job satisfaction using subscale data can be determined. The JSS was administered to 706 respondents from diverse work settings and geographic locations. Data were analyzed with a Rasch rating scale model and the BIGSTEPS computer program for the entire measure and the subscales individually. Correlational data had been presented in the original validation of the survey to support the existence of distinct subscales. The Rasch rating scale analysis shows that the mean error of the person measure, person separation, and person reliability indicate that the four item subscales do not reliably separate the respondents on the subtests. The analysis also suggests that even if the subtests were longer and more reliable, it is important to take the difficulty of the items into account before comparisons across subtests can be made. (Contains two tables and six references.) (SLD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 423 288

Measuring Job Satisfaction: Reliability of Subscale Analysis

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Betty Bergstrom

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Betty A. Bergstrom, Ph.D.
Computer Adaptive Technologies, Inc.

Mary E. Lunz, Ph.D.
American Society of Clinical Pathologists

Roundtable Presentation
Annual Meeting
American Educational Research Association
San Diego, California
April 1998

TM029095

Measuring Job Satisfaction:
Reliability of Subscale Analysis

Theoretical Framework

The Job Satisfaction Survey (JSS) (Spector, 1985, 1992), a 36-item survey instrument is designed to measure nine aspects of job satisfaction including pay, promotion, supervision, benefits, contingent rewards, operating procedures, co-workers, nature of work and communication. In addition to measuring the nine subscales, the scale was designed to yield a good measure of overall satisfaction. This paper looks at whether the survey measures job satisfaction overall and whether differences in job satisfaction using subscale data can be determined.

Classical analysis of survey data attempts to scale subjects on the construct of interest (Crocker & Algina, 1986; Banerji, Smith & Dedrick, 1997). Survey respondents are often placed on a continuum based on a raw score average obtained by arbitrarily assigning a quantitative number to a qualitative response (strongly disagree=1; strongly agree=4). Item and step difficulties are not taken into account. However, when survey instruments are analyzed with classical analyses, the limitations of raw scores interfere with performing arithmetic comparisons.

When the Rasch rating scale model is used to analyze likert-type survey data, 1) a linear scale is constructed that enables actual quantitative comparisons between persons and items 2) the difficulty of each item and the difficulty of each "step" or "rating" are estimated on the same scale as the estimation of person measures.

Data Collection

The JSS survey was administered in 1995 as part of a longitudinal study of professionals in an allied health occupation. Participants were randomly chosen from the total population of certified professionals. Sample size was 706 respondents from diverse work settings and geographic locations.

Data Analysis

Data were analyzed with the Rasch rating scale model (Wright & Masters, 1982) which estimates the probability that a survey respondent will respond to a particular item with a particular response category as:

$$\log[P_{nij}/P_{ni(j-1)}] = B_n - D_i - F_j$$

where P_{nij} is the probability of respondent n scoring in category j of item i; $P_{ni(j-1)}$ is the probability of respondent n scoring in category j-1 of item i; B_n is the measure of respondent n; D_i is the difficulty of item i and F_j is the difficulty of step j.

The JSS survey was analyzed using *BIGSTEPS* (Linacre, 1997): 1) Responses of all persons to all items were used to calibrate item difficulty and estimate an overall satisfaction measure for respondents. 2) Subtests were analyzed by anchoring the items and steps to the initial calibrated values and analyzing each subtest separately.

Results

Table 1 shows Total to Subscale and Subscale to Subscale correlations. Correlational data were presented in the original validation of the survey to support the existence of distinct subscales.

Table 1 Total / Subtest Correlations

	Total	1	2	3	4	5	6	7	8	9
Total	1.00									
1. Promotion	.56	1.00								
2. Supervisor	.64	.20	1.00							
3. Benefits	.51	.18	.18	1.00						
4. Contingent Rewards	.79	.49	.46	.28	1.00					
5. Operating Procedures	.47	.06	.26	.17	.26	1.00				
6. Co-workers	.57	.12	.42	.21	.37	.26	1.00			
7. Communication	.68	.30	.41	.23	.46	.34	.38	1.00		
8. Nature of work	.55	.18	.32	.17	.39	.19	.34	.34	1.00	
9. Pay	.62	.37	.21	.36	.53	.29	.15	.27	.17	1.00

Based on classical analysis, Spector (1985) concluded that "if the JSS does indeed measure conceptually distinct facets of job satisfaction...one would expect small to moderate correlations among the subscales." Correlations from the Spector validation study ranged from .11 to .59 with a median correlation of .35. Correlations for these data (Table 1) range from .06 to .53 with a median of .28, thus it might be concluded that the subscales are measuring distinct facets of job satisfaction for this population.

Table 2 shows the results of the Rasch rating scale analysis. Mean item difficulties range from -1.05 logits for Nature of Work to 1.31 logits for Promotion, indicating that some items are easier than others to indicate a high level of satisfaction are. Mean person satisfaction measures range from a low of .01 logits for satisfaction with Promotion to .25 for satisfaction with Supervisor. Reliability for subset measures range from .47 for Operating

Procedures to .71 for Supervisor. The mean error of the person measure, person separation and person separation reliability columns in Table 2 indicate that the four item subtests do not reliably separate the respondents on the subtests.

Table 2 Rasch Summary Statistics

	Items		Persons			
	N of Items	Mean (SD) Item Difficulty	Mean (SD) Satisfaction Measure	Mean Error Person Measure	Person Separation	Person Reliability
Total	36	0.00 (.84)	.06 (.79)	.25	2.93	.89
1. Promotion	4	1.31 (.24)	.01 (1.32)	.77	1.18	.58
2. Supervisor	4	-0.89 (.36)	.25 (1.75)	.83	1.58	.71
3. Benefits	4	-0.15 (.39)	.13 (1.42)	.81	1.38	.66
4. Rewards	4	0.54 (.24)	.08 (1.34)	.76	1.34	.64
5. Operating Procedures	4	-0.03 (.16)	.09 (1.08))	.77	0.95	.47
6. Coworkers	4	-0.63 (.83)	.14 (1.35)	.81	1.23	.60
7. Communication	4	0.26 (.56)	.10 (1.27)	.77	1.25	.61
8. Nature of work	4	-1.05 (.32)	.16 (1.38)	.84	1.17	.58
9. Pay	4	0.64 (.42)	.07 (1.46)	.77	1.47	.68

Importance

Despite the correctional evidence used with classical analysis that distinct subtests exist for the construct of job satisfaction, the Rasch rating scale analysis reveals that the four item subtests cannot reliability differentiate between survey respondents. The analysis also suggests that even if the subtests were longer and more reliable, it is important to take the difficulty of the items into account before comparisons across subtests can be made.

The authors welcome comment on this paper:

Betty A. Bergstrom, Ph.D.
Computer Adaptive Technologies, Inc.
1007 Church Street, 7th Floor
Evanston, IL 60201

bbergstrom@catinc.com

Mary E. Lunz, Ph.D.
American Society of Clinical Pathologists
2100 West Harrison Street
Chicago, IL 60612-0277

Measresinc@aol.com

References

Banerji, M., Smith, R. M., & Dedrick, R. F. (1997). Dimensionality of an early childhood scale: Using Rasch analysis and confirmatory factor analysis. *Journal of Outcome Measurement*, *1*(1), 56-85.

Crocker, L., & Algina, J. (1986). *Introduction to classical and modern test theory*. New York, NY: CBS College Publishing.

Linacre, J. (1997). *BIGSTEPS* [Computer Program]. Chicago, IL: MESA Press.

Spector, P. E. (1983). Measurement of human service staff satisfaction: Development of the job satisfaction survey. *American Journal of Community Psychology*, *13*(6).

Spector, P. E. (1992). *Summated rating scale construction: An introduction*. Sage University Paper Series on Quantitative Applications in the Social Sciences, vol. 07-082. Newbury Park, CA: Sage Publications.

Wright, B. D., & Masters, G. N. (1982). *Rating scale analysis*. Chicago, IL: MESA Press.